

Figure 1

$$H = \begin{bmatrix} 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 & 1 & 0 & 1 & 1 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 1 \end{bmatrix} \quad X = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ X_4 \\ X_5 \\ X_6 \\ X_7 \\ X_8 \\ X_9 \\ X_{10} \end{bmatrix}$$

Figure 2

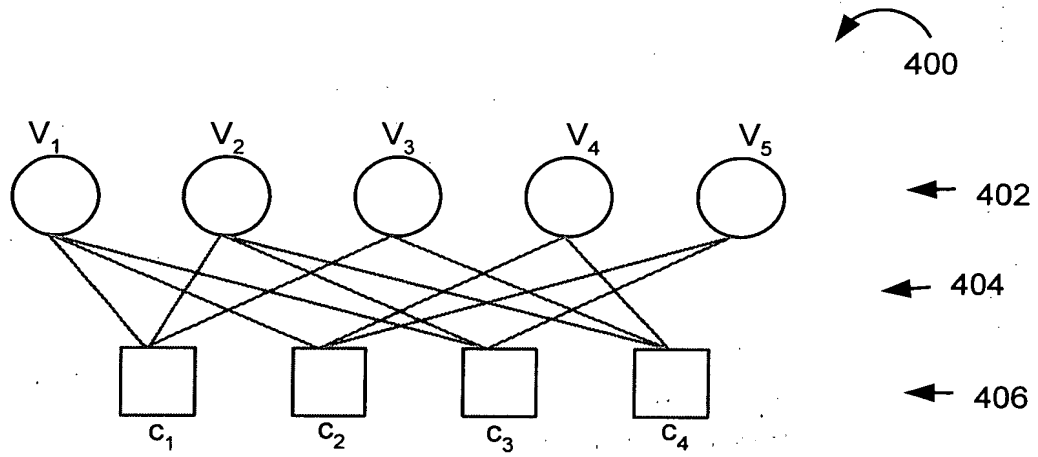


Figure 3

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 & 0 \end{bmatrix} \quad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{bmatrix}$$

Labels 502 and 504 point to the matrix H and the vector x respectively.

Figure 4

700

$$H' = \left[\begin{array}{c|c|c|c|c} 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 0 & 1 \\ \hline 1 & 0 & 0 & 1 & 1 \end{array} \right] = \begin{bmatrix} A & B & T \\ C & D & E \end{bmatrix} \quad 701$$

$$A = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} \quad 702 \quad B = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} \quad 703 \quad T = \begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad 704$$

$$C = [1] \quad 705 \quad D = [0] \quad 706 \quad E = [0 \quad 1 \quad 1] \quad 707$$

$$\begin{bmatrix} A & B & T \\ -ET^{-1}A + C & -ET^{-1}B + D & 0 \end{bmatrix} = \left[\begin{array}{c|c|c|c|c} 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 0 & 1 \\ \hline 1 & 1 & 0 & 0 & 0 \end{array} \right] \quad 708$$

$$\phi = -ET^{-1}B + D = [1] \quad 709 \quad \phi^{-1} = [1] \quad 710$$

Figure 5

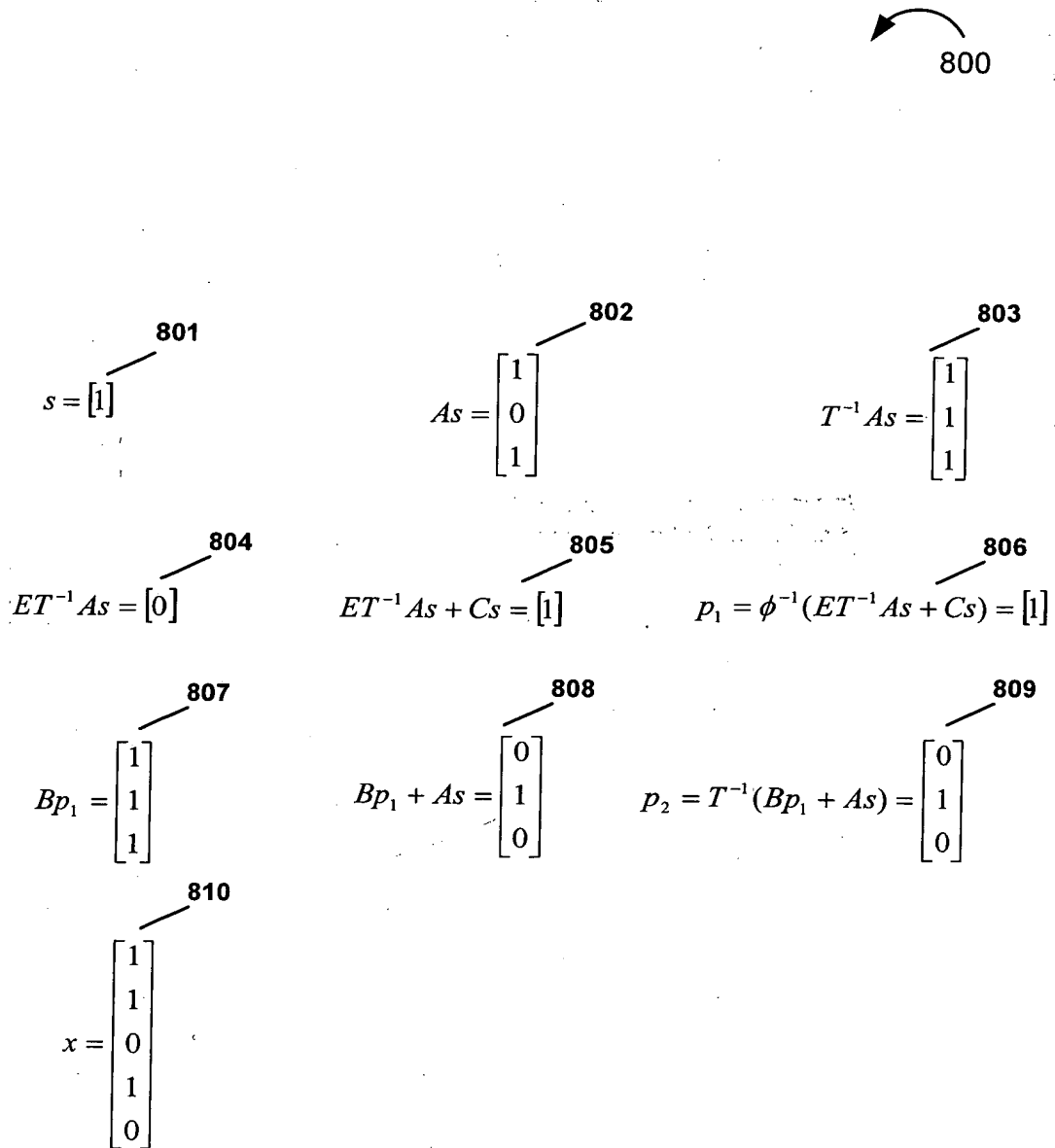


Figure 6

910 s	912 p_1	914 p_2			916 As			918 $T^{-1}As$			920 $ET^{-1}As$
0	1	2	3	4	5	6	7	8	9	10	11

902

	op	a	b		0	1	2	3	4	5	6	7	8	9	10	11
As	0	5	0	→	1	0	0	0	0	0	0	0	0	0	0	0
	0	7	0		1	0	0	0	0	1	0	0	0	0	0	0
$T^{-1}As$	0	8	5	→	1	0	0	0	0	1	0	1	0	0	0	0
	0	9	6		1	0	0	0	0	1	0	1	1	0	0	0
	1	9	8		1	0	0	0	0	1	0	1	1	1	0	0
$ET^{-1}As$	1	10	7	→	1	0	0	0	0	1	0	1	1	1	1	0
	0	11	9		1	0	0	0	0	1	0	1	1	1	1	1
	1	11	10		1	0	0	0	0	1	0	1	1	1	1	0
$Cs+ET^{-1}As$	1	11	0	→	1	0	0	0	0	1	0	1	1	1	1	1
$\phi^{-1}(Cs+ET^{-1}As)$	0	1	11	→	1	1	0	0	0	1	0	1	1	1	1	1
Bp_1+As	1	5	1	→	1	1	0	0	0	0	0	1	1	1	1	1
	1	6	1		1	1	0	0	0	0	1	1	1	1	1	1
	1	7	1		1	1	0	0	0	0	1	0	1	1	1	1
$T^{-1}(Bp_1+As)$	0	2	5	→	1	1	0	0	0	0	1	0	1	1	1	1
	0	3	6		1	1	0	1	0	0	1	0	1	1	1	1
	1	3	2		1	1	0	1	0	0	1	0	1	1	1	1
	1	4	7		1	1	0	1	0	0	1	0	1	1	1	1

904

906

Figure 7

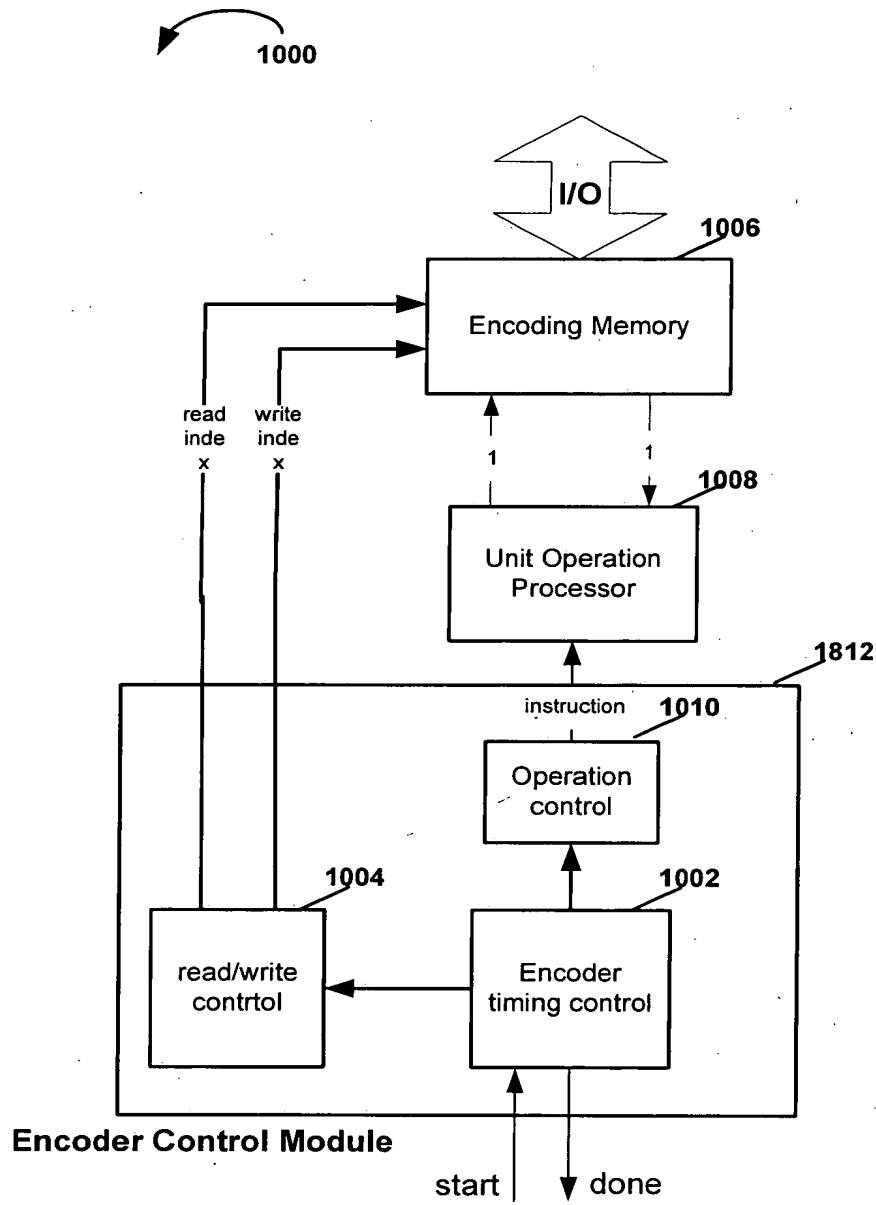


Figure 8

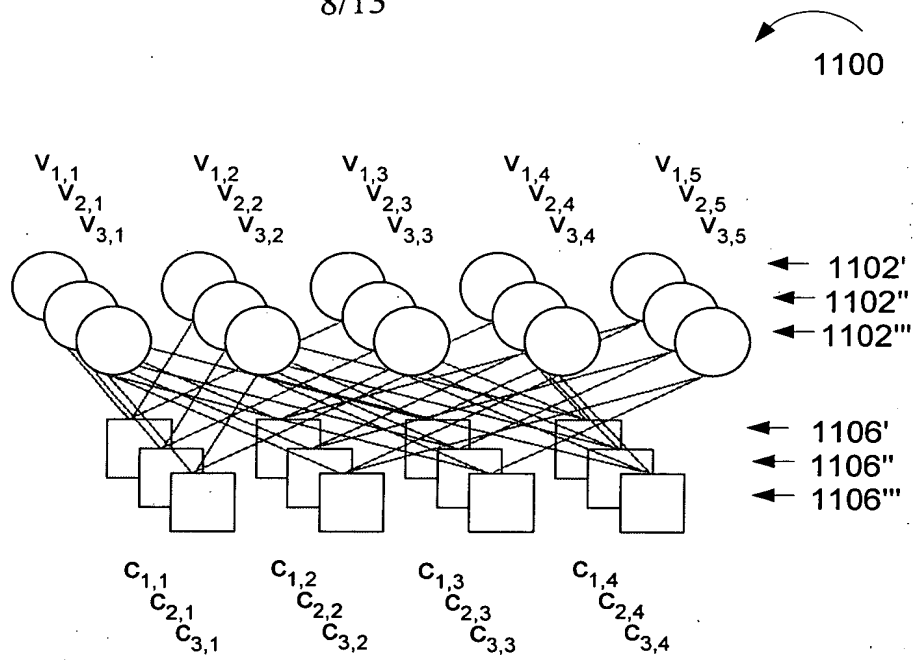


Figure 9

1202

1204

$$H = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$x = \begin{bmatrix} x_{1,1} \\ x_{2,1} \\ x_{3,1} \\ x_{1,2} \\ x_{2,2} \\ x_{3,2} \\ x_{1,3} \\ x_{2,3} \\ x_{3,3} \\ x_{1,4} \\ x_{2,4} \\ x_{3,4} \\ x_{1,5} \\ x_{2,5} \\ x_{3,5} \end{bmatrix}$$

Figure 10

1302
↙

$$H = \begin{bmatrix} 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} = \begin{bmatrix} \sigma^1 & \sigma^1 & \sigma^2 & 0 & 0 \\ \sigma^2 & 0 & 0 & \sigma^0 & \sigma^0 \\ \sigma^0 & \sigma^1 & 0 & 0 & \sigma^2 \\ 0 & \sigma^0 & \sigma^1 & \sigma^2 & 0 \end{bmatrix}$$

Figure 11

	x_1			x_2			x_3		x_4		x_5		
x_1	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10	1,11	1,12	← 1402'
x_2	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10	2,11	2,12	← 1402''
x_3	3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10	3,11	3,12	← 1402'''

	c_1			c_2			c_3			c_4			
c_1	2,1	2,4	3,7	3,2	1,9	1,11	1,3	3,5	2,12	1,6	2,8	3,10	← 1404'
c_2	3,1	3,4	1,7	1,2	2,9	2,11	2,3	1,5	3,12	2,6	3,8	1,10	← 1404''
c_3	1,1	1,4	2,7	2,2	3,9	3,11	3,3	2,5	1,12	3,6	1,8	2,10	← 1404'''

Figure 12

1500

1501

$$H' = \begin{bmatrix} \sigma^1 & \sigma^1 & \sigma^2 & 0 & 0 \\ 0 & \sigma^0 & \sigma^1 & \sigma^2 & 0 \\ \sigma^0 & \sigma^1 & 0 & 0 & \sigma^2 \\ \sigma^2 & 0 & 0 & \sigma^0 & \sigma^0 \end{bmatrix}$$

1502

$$A = \begin{bmatrix} \sigma^1 \\ 0 \\ \sigma^0 \end{bmatrix}$$

1503

$$B = \begin{bmatrix} \sigma^1 \\ \sigma^0 \\ \sigma^1 \end{bmatrix}$$

1504

$$T = \begin{bmatrix} \sigma^2 & 0 & 0 \\ \sigma^1 & \sigma^2 & 0 \\ 0 & 0 & \sigma^2 \end{bmatrix}$$

1505

$$C = [\sigma^2]$$

1506

$$D = [0]$$

1507

$$E = [0 \quad \sigma^0 \quad \sigma^0]$$

1508

$$\begin{bmatrix} A & B & T \\ -ET^{-1}A+C & -ET^{-1}B+D & 0 \end{bmatrix} = \begin{bmatrix} \sigma^1 & \sigma^1 & \sigma^2 & 0 & 0 \\ 0 & \sigma^0 & \sigma^1 & \sigma^2 & 0 \\ \sigma^0 & \sigma^1 & 0 & 0 & \sigma^2 \\ \sigma^2 & \sigma^2 & 0 & 0 & 0 \end{bmatrix}$$

1509

$$\phi = [\sigma^2]$$

1510

$$\phi^{-1} = [\sigma^1]$$

Figure 13



1600

1601

$$s = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

1602

$$Cs = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

1604

$$As = \begin{bmatrix} 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \end{bmatrix}$$

1605

$$T^{-1}As = \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 1 \end{bmatrix}$$

1606

$$ET^{-1}As = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

1607

$$ET^{-1}As + Cs = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$$

1608

$$p_1 = \phi^{-1}(ET^{-1}As + Cs) = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$$

1609

$$Bp_1 = \begin{bmatrix} 0 \\ 0 \\ 1 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \end{bmatrix}$$

1610

$$Bp_1 + As = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 1 \\ 0 \\ 1 \end{bmatrix}$$

1611

$$p_2 = T^{-1}(Bp_1 + As) = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 1 \\ 1 \end{bmatrix}$$

1612

$$x = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 1 \\ 1 \\ 1 \end{bmatrix}$$

Figure 14

1702

s	p_1	p_2			As		$T^{-1}As$			$ET^{-1}As$	
0	1	2	3	4	5	6	7	8	9	10	11

↑
3
↓

	op	a	r	b		0	1	2	3	4	5	6	7	8	9	10	11
As	0	5	1	0	→	4	0	0	0	0	0	0	0	0	0	0	0
	0	7	0	0		4	0	0	0	0	1	0	0	0	0	0	0
$T^{-1}As$	0	8	1	5	→	4	0	0	0	0	1	0	4	2	0	0	0
	0	9	1	6		4	0	0	0	0	1	0	4	2	0	0	0
	1	9	2	8		4	0	0	0	0	1	0	4	2	1	0	0
	1	10	1	7		4	0	0	0	0	1	0	4	2	1	1	0
$ET^{-1}As$	0	11	0	9	→	4	0	0	0	0	1	0	4	2	1	1	1
	1	11	0	10		4	0	0	0	0	1	0	4	2	1	1	0
$Cs+ET^{-1}As$	1	11	2	0	→	4	0	0	0	0	1	0	4	2	1	1	2
$\phi^{-1}(Cs+ET^{-1}As)$	0	1	1	11	→	4	4	0	0	0	1	0	4	2	1	1	2
Bp_1+As	1	5	1	1	→	4	4	0	0	0	0	0	4	2	1	1	2
	1	6	0	1		4	4	0	0	0	0	4	4	2	1	1	2
	1	7	1	1		4	4	0	0	0	0	4	5	2	1	1	2
$T^{-1}(Bp_1+As)$	0	2	1	5	→	4	4	0	0	0	0	4	5	2	1	1	2
	0	3	1	6		4	4	0	1	0	0	4	5	2	1	1	2
	1	3	2	2		4	4	0	1	0	0	4	5	2	1	1	2
	1	4	1	7		4	4	0	1	3	0	4	5	2	1	1	2

1704

1706

Figure 15

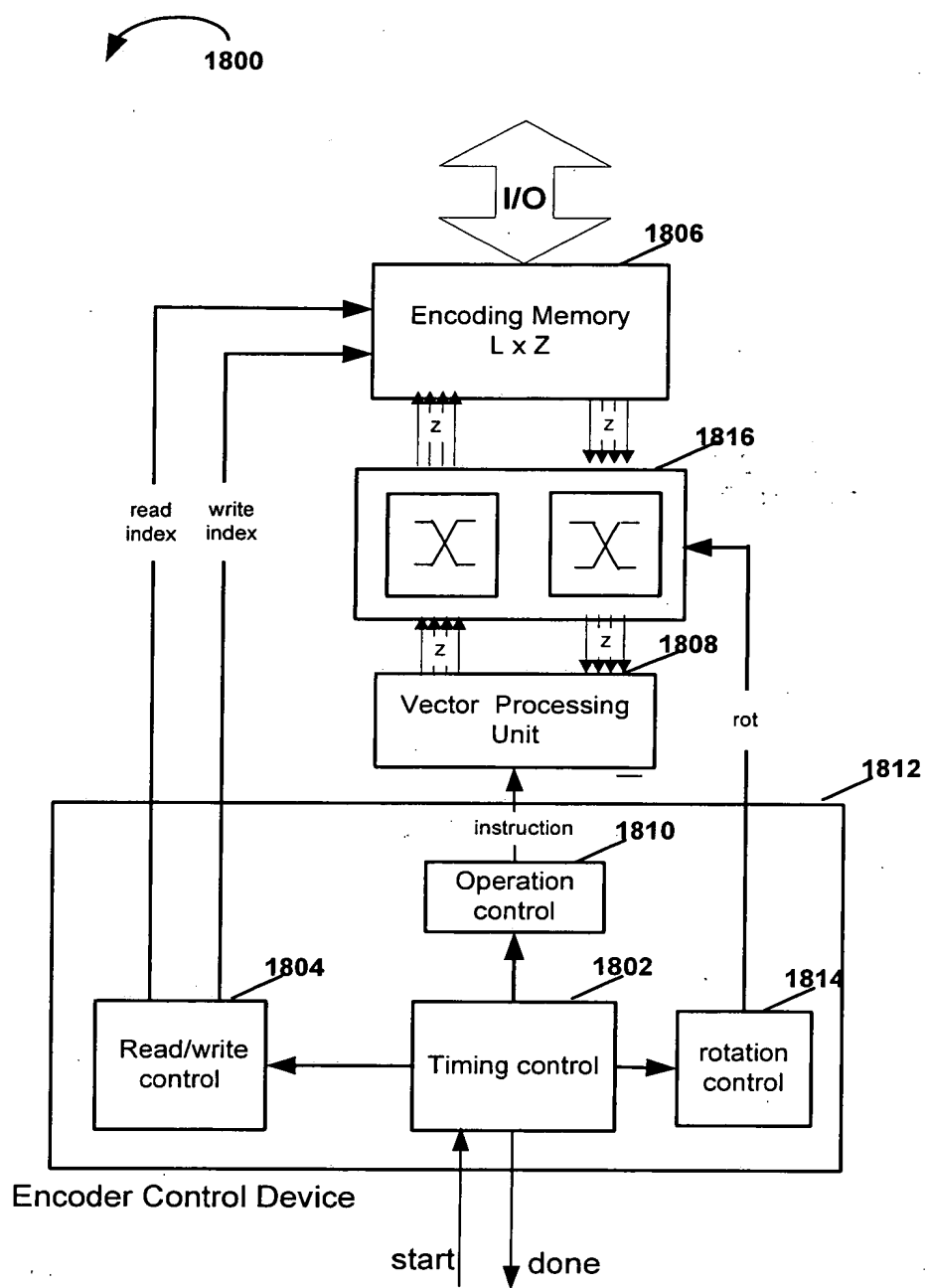


Figure 16